Occupational Health and Safety Plan

Prepared for

Prepared by
Al Irvine, B.Sc., R.P.Bio.
New Graph Environment Ltd.

Version 0.0.2 2023-07-19

Table of Contents

Acknowledgement iv
1 Safety Policy 1
1.1 Forest Safety Accord 1
1.2 Corrective Action Log 3
1.3 Safety Team Members 3
1.4 Roles, rights and responsibilities 3
1.5 COVID 19 Prevention and Risks 3
1.6 Required safety meetings 5
1.7 First Aid equipment and procedures 5
2 Plans and Assessments 7
2.1 Field Safety Plans 7
2.2 Hazard / close-call / incident reporting requirements and procedures 7
2.3 Emergency Response Plan (ERP) and Procedures 7
2.4 Site and Worker Assessments 9
2.5 Contractor Selection Policy 11
2.6 Personal Protective Equipment (PPE) policy 12
2.7 WHMIS orientation and location of the Material Safety Data Sheets (MSDS) 15
2.8 Records of Training 15
2.9 Progressive discipline policy 15
3 Safe Work Procedures and Practices 17
3.1 Driving 17
3.2 All-terrain vehicles 19
3.3 Electrofishing 19
3.4 Culvert and habitat confirmation assessments 21
3.5 Swiftwater rescue and safety 22
3.6 Working Alone 25
3.7 Wildlife Encounters 25
3.8 Remote Working 28
Appendices 31
Appendix 1 - New Worker Orientation 31
Appendix 2 - Tailboard Template 31
Appendix 3 - Incident/Close Call Template 31
Appendix 4 - Contractor Selection and Safety Checklist 31
Appendix 5 - First Aid Requirements 31
References 33
Session Info 35

Acknowledgement

Modern civilization has a long journey ahead to acknowledge and address the historic and ongoing impacts of colonialism that have resulted in harm to the cultures and livelihoods living interconnected with our ecosystems for many thousands of years.

1 Safety Policy

At New Graph Environment we believe that all injuries are preventable and that safety is the responsibility of everyone. We believe that getting hurt at work is not acceptable and that by building a culture of safety we:

- will look ahead to identify hazards,
- will document safety procedures and ensure that our management, staff and contractors are familiar with them and understand why we have them,
- will strive for continuous improvement to ensure that we learn from the past and look to the future to facilitate the safest working environment possible for ourselves, our contractors, our clients and the public.

1.1 Forest Safety Accord

THE SAFETY ACCORD
OF THE BC FOREST INDUSTRY

Our Key Beliefs:

- We believe that all fatalities and injuries are preventable.
- We believe in a culture where the health and safety of all workers is an over-riding priority.
- We believe that excellence in health and safety is important to our long-term success.

Shared Responsibility:

- We are collectively and individually responsible for the safety of all workers and all worksites.
- Individuals must assume responsibility for their own safety and the safety of co-workers by following all safety rules, procedures and practices; by refusing to perform unsafe work; and by taking collective responsibility for the unsafe conduct of others.
- Tenure holders, licencees and prime contractors must take a leadership role in ensuring worker health and safety and assuring accountability for safety on the worksite.

Recognition of Safety Performance and Practices:

- The commitment to health and safety is to all workers, not just direct employees. When engaging contractors, sub-contractors and others to provide services, the selection process and administration of contracts will include recognition and support of good safety performance and practices.
- Employers will recognize and support the safety performance of their employees.
- All owners of forested lands, tenure holders and licencees will give weight to the safety record and current practices of companies in the awarding of contracts and in the determination of fees and levies.

Commitment to Training and Supervision:

- We understand the importance of workers being fully prepared for the work they do and the provision of competent supervisors who will insist on and enforce safe work practices. All workers on the worksite must be competent and fully trained and certified for the work they are performing.

Legislation:

- It is understood that the regulatory environment of the Forest Industry can have profound impacts on safety. Accordingly, government ministries and agencies must take into account the importance of health and safety when developing, reviewing and drafting applicable areas of law and regulation.

Continual Improvement:

- We are committed to the on-going improvement of our practices and support efforts to develop and implement new methods, procedures and technologies that have the potential to improve safety.

WorkSafe
WORKERS' COMPENSATION BOARD OF BC

BC Forest Safety Council
Unsafe is Unacceptable

1.2 Corrective Action Log

These corrective actions are to be completed by the person indicated, within the time frame allotted. If more time is required, or there are difficulties encountered, please contact Allan Irvine for assistance. These comments or corrective actions are based on the quality assurance review by the BC Forest Safety Council.

Table 1.1: Corrective Action Log (last updated 2022)

Item	Company Action Plan	Person Responsible	Due Date	Date Closed
Continual Improvement Suggestion: The company has submitted the 2020 CL with this 2022 audit instead to the 2021 CAL returned to the company with you last audit review letter. The company did not receive credit for the submission of the correct CAL, and questions 4, 10, and 11 with your 2021 audit. The CAL submitted here should identify the deficient questions and indicate what the company is doing or plans to do to correct them all.	Submit 2022 CAL with current 2023 audit.	AI	30/07/2023	12/06/2023
Recommendation: Please obtain a Regulation compliant orientation form. Orientation checklists must contain all items listed in section 3.23 of the OHS regulations. Missing was the instruction and demonstration of work tasks and work processes. A single page compliant orientation checklist is available on the BCFSC website.	Update new worker assessment forms.	MW	30/07/2023	12/07/2023
Continual Improvement Suggestion: The “Worker Is competent.” has not been selected in either forms submitted - which is the sole purpose of a worker assessment.	Assess worker competence and ensure all associated checkboxes are filled out.	AI	30/07/2023	12/06/2023
Recommendation: Please submit 1 monthly safety meeting or pre-work minutes from every operating month, from the current audit reporting year (the preceding 12 months to you June 28, 022 audit submission date). the company reported worked in all 12 months of July 2021 - June 2022, You may also submit the safety / fatality alerts covered in the monthly meeting agendas.	Submit all available monthly safety meetings.	AI	30/07/2023	12/06/2023
Continual Improvement Suggestion: Please check one box in all question 15-22 on the audit tool - decaling if the question applies to this current years reporting, with all future audits.	Ensure all questions in audit are answered and all required boxes are checked.	AI	30/07/2023	12/06/2023

1.3 Safety Team Members

As a small company all management and staff are considered safety team members and expected to integral to the safety program. Feedback is encouraged as continual improvement is a paramount goal.

1.4 Roles, rights and responsibilities

Everyone has a role to play in workplace safety. Wether you are the owner, employer, supervisor, worker, or prime contractor. Know your rights and responsibilities. These are outlined on the WorkSafeBC website here.

1.4.1 Right to refuse work and report unsafe conditions

You have the right to refuse unsafe work if you have reasonable cause to believe the work you are doing could create a hazard or cause an injury. Identify hazards before starting work and determine whether it is safe to proceed. This is work and it is not worth it to risk life and limb.

1.5 COVID 19 Prevention and Risks

We have developed a COVID-19 Safety Plan that outlines the policies, guidelines, and procedures to reduce the risk of COVID-19 transmission.

All staff, contractors, volunteers, and participants must complete a self-assessment (https://bc.thrive.health/covid19/en) before starting work each day. If they are experiencing any symptoms related to COVID-19 they must halt all involvement or participation, notify the project supervisor, and get officially tested.

The virus that causes COVID-19 spreads in several ways, including through droplets when a person coughs or sneezes, or from touching a contaminated surface before touching the face. Planning to COVID-19 is a moving target and should be a continuous effort. Planning is outlined by WCB (https://www.worksafebc.com/en/about-us/covid-19-updates/covid-19-returning-safe-operation). Detailed procedures are included in the safe work procedures in the Appendices of this document and were developed by progressing through the following steps:

1. Assess the risk at your workplace to identify places where the risk of transmission is introduced
    a. What job tasks or processes require workers to come into close proximity with one another or members of the public?
    b. What tools, machinery, and equipment do people come into contact with in the course of their work?
    c. What surfaces are touched often, such as doorknobs, light switches, equipment, and shared tools?
2. Implement measures to reduce the risk
    a. Maintain a distance of 2 metres (6 feet) between workers and others wherever possible
    b. Create pods of workers who work together exclusively to minimize the risk of broad transmission throughout the workplace
    c. Where physical distance cannot be maintained consider the use of masks.
    d. Provide adequate hand-washing facilities on site for all workers
    e. Develop policies around when workers must wash their hands, including upon arriving for work, before and after breaks and before and after handling common tools and equipment.
    f. Implement a cleaning protocol for all common areas and surfaces, including washrooms, equipment, tools, common tables, desks, light switches, and door handles. Ensure those engaged in cleaning have adequate training and materials.

g. Remove any unnecessary tools or equipment that may elevate the risk of transmission.

3. Develop policies to manage the workplace

a. Anyone who has had symptoms of COVID-19 in the last 10 days must self-isolate at home.

b. Anyone under the direction of the provincial health officer to self-isolate must follow those instructions

c. When workers or contractors are feeling ill at work they should immediately let their supervisor know and go home. If symptoms align with those of COVID-19 they should be tested and self-isolate until they are symptom free and have a negative test result.

1.6 Required safety meetings

1.6.1 New Worker Orientations

New workers are at a high risk for injuries. They need to know the safety policies and procedures and demonstrate that they understand how to protect themselves and others. All employees and dependent contractors operating under your company's safety plan must review the New Graph health and safety policies and safe work procedures on their first day before they start work or when returning to work after an absence of longer than 6 weeks. Template to be filled out is attached as Appendix 1 (page 31).

1.6.2 Tailboards

Tailboard meetings are a way to reset at the start of new work tasks to put safety first as the top priority at all places of work. Our tailboard template is unique in that it contains documentation of numerous safety policy actions in one place. Tailboards include references to field safety plans and contain:

- Site Assessments, Hazard Identifications and Risk Assessments
- Worker Assessments
- Personal Protective Equipment Checklist/Inspections
- Machinery Inspection (Vehicle/Trailer/ATV)
- Emergency Contact List and Info
- Call In/Call Out Numbers for Check-ins
- Hazard Inspections
- First Aid Assessments

They are included in this plan as Appendix 2 (page 31).

1.7 First Aid equipment and procedures

A level 1 kit is kept under the seat of each work vehicle and our OHSP is also kept in the truck. The kit should be inspected for contents to see that it is complete. A weatherproof container is

recommended for all items except the blankets. Below is an itemized list of what should be in the kit:

Quantity	Required Item
1	Blanket
24	14 cm x 19 cm wound cleansing towelettes, individually packaged
50	Sterile adhesive dressings, assorted sizes, individually packaged
10	10 cm x 10 cm sterile gauze dressings, individually packaged
4	10 cm x 16.5 cm sterile pressure dressings with crepe ties
2	7.5 cm x 4.5 m crepe roller bandages
2	7.5 cm conforming gauze bandages
1	2.5 cm x 4.5 m adhesive tape
2	Cotton triangular bandages, minimum length of base 1.25 m
2	Quick straps (a.k.a. fracture straps or zap straps)
1	Windlass style tourniquet
1	14 cm stainless steel bandage scissors or universal scissors
1	11.5 cm stainless steel sliver forceps
1	Pocket mask with a one-way valve and oxygen inlet
6	Pairs of medical gloves (preferably non-latex)
1	Waterproof waste bag
	First aid records

1.7.1 Worksite First Aid Requirements

To determine an adequate and appropriate level of first aid coverage, the first step is a first aid assessment. This requires a full review of the workplace. The assessment will help you determine the minimum level of first aid needed in your workplace. First aid levels are outlined in the OHS Regulation Schedule 3-A: Minimum Levels of First Aid. First aid requirements are found in Appendix 5 (page 31).

Below are the steps for a first aid assessment.

- Identify the number of workplaces.
- Identify your workplace hazard rating.
- Consider the surface travel time to a hospital.
- Determine the number of workers on a shift.
- Determine the required first aid services for your workplace.
- Review your assessment.

2 Plans and Assessments

2.1 Field Safety Plans

Field safety plans are written up before traveling to any job site. Information included in these plans include:

- Location and contact info of accommodations where employees are staying.
- Description of personal and company vehicles.
- Crew member contact details, including emergency contacts.
- Personal and crew equipment checklist.
- Location and contact info of nearest hospital.
- Check in and failed check in procedures.
- A brief description of the job, as well as map links and a list of possible locations where crew members will visit.

2.1.1 Check-in Procedures and Field Communications

Call, text or in reach emergency contact each morning to share the plan for the day (i.e. name of roads and sites). Agree on a regular daily check in time and report position/provide updates.

2.1.2 Procedures for Failed Check-In

If phone call or in reach check-in is not received by agreed upon time, send text to in reach units, call or text cell phones of field crew members. If no response please call accommodations, then personal emergency contacts to see if they have heard anything. Wait 1 hour and text in reach, text or call cell phones and personal emergency contacts and accommodations again. Repeat after 2 hours - if no response then notify the RCMP of a missing persons in field.

2.2 Hazard / close-call / incident reporting requirements and procedures

Incidents are situations in the workplace that resulted in or could have resulted in injuries, illnesses, or fatalities. Close calls are incidents that almost happened. These can be used to prevent incidents in the future. We have policies in place so that we can document and review close calls. Reporting templates are attached as Appendix 3 (page 31).

2.3 Emergency Response Plan (ERP) and Procedures

Remote Site Emergency Call-In Procedures:

- Dial RCMP
- Name:
- Location: (GPS, UTM Co-ordinates, Road Km)
- Phone #
- Nature Of Injury: (severity, what happened, and # of Victims)
- Environmental Conditions: (weather, slope, access conditions)
- Request what you are going to need: (SAR, PEP, Helicopter,)

2.3.1 Fire Response

- Regularly monitor the fire weather index using representative weather station and determine the appropriate Fire Danger Class for the area. For Danger Class Reports go to: http://bcwildfire.ca/Weather/Maps/danger_rating.html
- Stop operations and notify he manager and crew immediately upon observation of a fire.
- Manager should either act as the emergency response team leader or designate another crew member to assume the emergency response team leader role.
- Call Forest Fire Reporting : 1-800-663-5555 or * 5555 on the Cantel and Telus networks
- The individual reporting the fire shall remain available to communicate details of the fire suppression activity taken and what may be required.
- The remaining crew shall begin immediate action on the fire to their level of safety and competence provided it is determined by the emergency response team leader that the fire can be safely controlled by the crew.
- The person in charge of the crew during suppression operations will continue to supervise the efforts until relieved by licensee/contractor representative or BC Wildfire Management Branch personnel.

2.3.2 Landslide, Avalanche, and Natural Disaster Response

- Ensure all workers are trained and understand response procedures and this emergency response plan is available on site at all times.
- Notify supervisor and other workers. If safe to do so, assess situation to determine if activities must be shutdown.
- Take steps to control further environmental impacts.
- Supervisors must account for all workers before leaving the site. If a shutdown is required, park all equipment in an environmentally safe location (avoid riparian management areas, steep side slopes, steep road sections, areas with excessive soil moisture, and areas within reach of standing timber).
- Contact appropriate parties if significant environmental damage or damage to infrastructure requiring repair has occurred (MFLNRO, BCTS, MoTI, etc.).

2.3.3 Spill Response

Step 1. Ensure Safety

- Assess site hazards to ensure safe work procedures.
- Notify Site Supervisor and Environmental Monitor (EM).
- If unsure of the product, consult the MSDS sheets.
- Eliminate ignition sources if spilled material is flammable.
- Wear proper personal protective equipment (gloves) contained in the spill kit.

Step 2. Contain the spill

- Eliminate the source of the spill.
- Use contents of the provided spill kit(s) to stop the spread of the spill/leak. Absorbent socks can be used to surround the spill.

- **Remember: White = Fuels & Oils Only, Gray = Universal (Fuels, Oils and Chemicals such as antifreeze)**
- Divert spill away from ditches and watercourses.
- Once the spill is contained, attempt to soak it up using an absorbent pads.
- Place the absorbent pads and any contaminated soil in a container and dispose of it in accordance with the MSDS sheet and provincial regulations.

Step 3. Reporting Requirements

- All spills must be reported to the Site Supervisor and the EM. If the EM cannot be reached, notify the Provincial Emergency Program (PEP) at 1-800-663-3456 if the spill meets the thresholds detailed in the Spill Reporting Regulation of BC. A summary of the reporting thresholds for the most likely spilled materials is below.

Spill Reporting Thresholds Oil Fuel, Oil & Hydraulic fluid: Any quantity that enters or is likely to enter water >100L to land Antifreeze: Any quantity that enters or is likely to enter water >25L to land

2.3.4 Injury

Minor wounds, breaks, strains:

- Ensure site is safe, stabilize patient (provide first-aid), transport to closest Hospital, if necessary.
- Advise office and hospital when you are on route
- If accident is the result of a motor vehicle accident, please advise the RCMP at 250 353 2225

Serious injury:

- Ensure site is safe, then stabilize (provide first-aid) and/or prepare patient for transport.
- Activate SPOT messenger, or call 1 800 461 9911 (if using the satellite phone).
- Provide nature of injuries, location co-ordinates in UTM or longitude and latitude for landing site, and communication method to use on the way to the accident site.
- If air evacuation is required, you must advise the communication centre you've reached; if road evacuation is used, then advise if you will be meeting the ambulance en route.

2.3.5 Fatality

- Ensure site is safe
- Activate SPOT messenger, or call 1 800 461 9911 (if using the satellite phone)
- Contact Nelson WCB at 1 800 663 4962
- Do not disturb the site, cover the body, ribbon off the area, and block access if possible

2.4 Site and Worker Assessments

Conducting a systematic risk assessment will help identify the hazards that exist in the workplace, and how they may put workers at risk. To determine if we've done enough to protect our workers,

we use a rating system as part of our risk assessment. Risk is calculated by multiplying the likelihood by the severity.

Examples of risks/hazards found in and around job sites include, but are not limited to:

- Wildlife
- Swiftwater
- Vehicle traffic
- Slippery/uneven ground
- Exposure to heat or cold
- Machinery
- ATV (roll over, burns, collision)
- Chemicals
- Chainsaw/loppers/knives
- Electrofisher shocks
- Open water
- Overhead snags and sharp branches

2.5 Contractor Selection Policy

At New Graph we are responsible to ensure that the contractors we hire to complete and assist on projects are compliant with the workers compensation act and have a record that illustrates they have a culture of safety. For forestry related work, contractors are required to be part of Safe Certified companies. We have a checklist that we require our contractors to complete to ensure that they meet our requirements. Our policy is to always get a clearance letter before and after we receive services from a contractor to confirm whether they registered with worksafe BC and are

paying premiums. The contractor selection and safety checklist forms are included as Appendix 4 (page 31).

Of note, contractors are considered our workers if they do not operate as an independent business and are either not eligible for WorkSafeBC coverage or decline to purchase WorkSafeBC's optional coverage. Below are examples of situations where a contractor would likely be our worker:

- The contractor supplies only labour
- The contractor supplies labour and minor materials
- The contractor supplies labour and a piece of major equipment but is not registered with WorkSafeBC

2.6 Personal Protective Equipment (PPE) policy

All employees will be provided the required PPE when they are hired, and instructed on its proper use and care. Employees are responsible for keeping PPE in good working condition and notifying their supervisor if any PPE no longer meets safe standards.

All PPE must meet regulatory and Canadian Standards Association standards.

The following provides a *guideline* to the requirements and use of PPE. A full listing of requirements can be found in the Occupational Health and Safety Regulation at https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-regulation/part-08-personal-protective-clothing-and-equipment

PPE	Requirements	Used in these situations
High visibility clothing (vest)	• The apparel must be a color that contrasts with the environment.	• When worker is outside of the vehicle. • On all construction sites
Limb and body protection	• Must be free of holes and, in the case of hand protection, made of a material that provides a good grip.	• When the worker is exposed to a substance or condition that is likely to puncture, abrade or affect the skin – or be absorbed through the skin.
Warm dry clothing		• All field work situations. Particularly in night work and during seasons of typically variable and cold wet weather.

PPE	Requirements	Used in these situations
Wading Belt		• Must be worn around waste snugly in conjunction with waders to ensure that waders do not fill with water in the event of a fall in the water.
Wading Boots	• Soft rubber or felt sole footwear specifically designed for stream work	• When stream work is required.
Polarized glasses		• Must be worn while working in and around water
Throw bag and releasable safety rope	• Must be 15 meters of line.	• When worker is working in/ or around swift water
Personal Flotation Device	• Must be Canadian General Standards Approved • Must be stored in a dry area. • Avoid exposure to sunlight.	• When worker is working in/ or around deep open water
Hard hats	• High- visibility, hardhat. • Cleaned regularly and stored away from grease and tools.	• Must be worn in any work area where there is a danger of head injury from falling, flying or thrown objects, or other harmful contacts. • Must be worn on all construction based job sites.
Helmets	• Must be DOT approved	

PPE	Requirements	Used in these situations
• Must be free of cracks, dents or any other damage.	• Must be worn when operating ATV/ snowmobile.	
Eye and face protection	• Safety eyewear must fit properly and include side shields when necessary for worker safety.	• Safety eyewear must be worn when working in conditions that are likely to injure or irritate the eyes. • Face protectors must also be used if there is a risk of face injury such as when operating a chain or brush saw.
Safety footwear	• Must be of a design, construction and material appropriate to the protection required for the work environment	• Appropriate footwear must consider the following factors: slipping, uneven terrain, abrasion, ankle protection and foot support, crushing potential, temperature extremes, corrosive substances, puncture hazards, electrical shock, and any other recognizable hazard. • Toe and metatarsal protection, puncture resistance, and/or dielectric protection must be used where appropriate. • Caulked or other equally effective footwear must be worn by workers who are required to walk on logs, piles, pilings or other round timbers.
Hearing protection	• WorkSafeBC's regulations regarding noise exposure are: ◦ 85dBA Lex daily noise exposure level	

PPE	Requirements	Used in these situations
◦ 140 DBC peak sound level	• If those levels cannot be practicably met, the employer must: ◦ Reduce levels as low as possible ◦ Provide to workers hearing protection that meets CSA standards, and ensure it is worn effectively in noise hazard areas	
Bear Spray / Bangers	• Always worn in remote locations • Inspected regularly and stored in a safe, dry place.	• Must be readily available in case of any bear sighting. • Must be carried for all remote worksites or worksites where there is potential bear activity. • Ensure equipment has current use by date attached.

2.7 WHMIS orientation and location of the Material Safety Data Sheets (MSDS)

2.8 Records of Training

A training log of all employee training/certifications can be found in the data folder here.

2.9 Progressive discipline policy

Actions and behaviors that create or facilitate unsafe working environments and elevate the risk of injury to company representatives, contractors and the public are unacceptable. To ensure that

these actions and behaviors do not persist once identified, the following progressive discipline policy has been implemented.

1. Verbal Warning
2. Documented Warning
3. Letter of Reprimand
4. Discharge

3 Safe Work Procedures and Practices

3.1 Driving

3.1.1 Procedures and Practices

- Conduct a “pre-trip” vehicle check. Use a Vehicle Pre-trip Inspection and Mileage Log to track activity. Report deficiencies and do not use if equipment is in unsafe condition.
- Make notes of required maintenance in the mileage logbook when it is required and include “checking the logbook for required repairs” at the time of each inspection.
- Drive defensively at all times.
- Ensure all vehicle occupants are wearing seatbelts. You are responsible for your passengers.
- Do not exceed posted speed limits.
- Avoid night driving when possible, never drive when distracted or overly fatigued. Limiting the length of field days can help reduce the risk of injury when driving.
- On resource roads do not exceed 80kph or posted speed limits.
- Drive safely and drive to the existing road conditions. Lower speed as required. Stay home if conditions are hazardous and risk of injury is high. Be aware of:
    - Visibility reduced by dust, fog, rain and snow;
    - Narrow roads with over width vehicles;
    - Steep favorable and adverse gradients;
    - Slippery and variable road surface conditions due to loose gravel, snow, ice or mud;
    - Other users, wildlife
- Use vehicle for intended use only (purpose and weight limitations).
- Drive with vehicle lights on at all times.
- Secure all heavy or sharp objects in the cab of the vehicle.
- Respect that loaded logging trucks have the right of way on single lane roads.
- Tailgating is driving too close behind other vehicles. It is extremely cangerous as it can lead to accidents if they vehicle in front of you brakes suddently or is in a collision/crash you can smash into them. Leave a sufficient distance in front of the vehicle in front of you, even more so for logging trucks. A good rule of thumb is to leave 3-4 seconds of time between when the vehicle in front of you passes a specific location and when you pass it.

- Pass trucks or equipment only after you receive a clearly visible and/or audible signal from the operator.
- Never chase a runaway vehicle.
- Stay on your side of the road.

  COVID 19 (COVID)

  - Self-assess daily for COVID symptoms and self-isolate and test if you have symptoms.
  - When possible, travel in separate vehicles. When a crew is required to travel together, sit in seats as far from eachother as possible, wear masks and when possible leave the windows open for good ventilation.
  - All vehicles need to have paper towel, min 70% alcohol hand sanitizer and non-medical grade masks. Ensure this is present before leaving.
  - When getting in vehicle wipe down all initial touch points with min 70% alcohol and paper towel (ex. Vehicle door, radio, steering wheel, shifter, seat belt). Sanitize all surfaces of both hands.
  - After opening vehicle door at all stops and worksites use hand sanitizer on surfaces of both hands. Put on non-medical mask if entering building (ex. Gas station, restaurants) or working with others where you cannot keep min 2m distance. Upon exiting vehicle close door with elbow.

3.1.2 Radio Use

- Complete radio check and ensure correct frequency prior to entering radio controlled area.
- Do not drive on radio controlled roads without the radio on and turned up. Expect oncoming traffic at all times.
- Call your position according to the local radio protocol and signage.
- Notify other radio equipped vehicles of oncoming non-radio equipped traffic.
- Do not use road radio channels for conversations, use only for road traffic protocols.
- Other than traffic control, pull over and safely park when talking on the radio for an extended period of time.

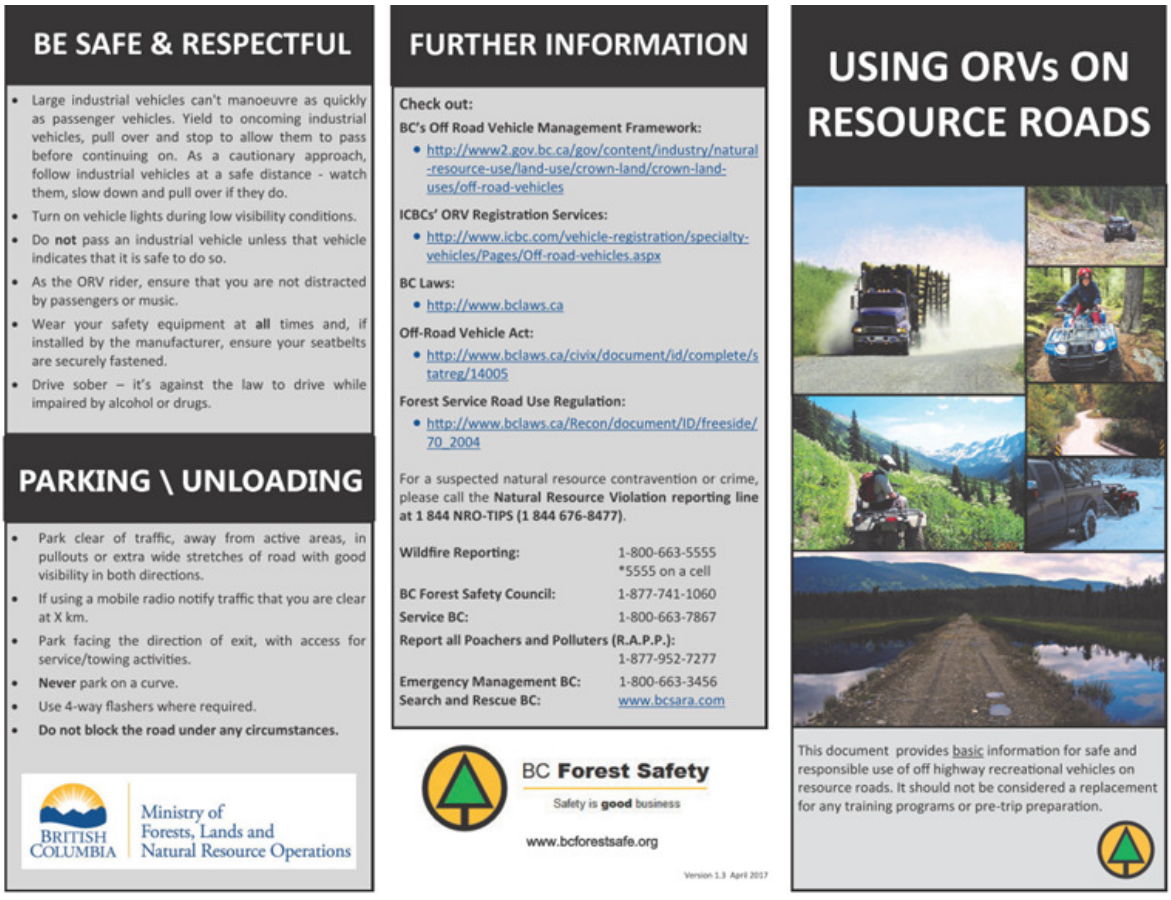
3.1.3 Parking and Key Management

- When working in the field, it is important to manage your keys. Always carry a spare key and keep it hidden somewhere on the vehicle that can be accessed if keys are lost. As a good practice and particularly important if you do not have a spare key - hide primary keys

somewhere on your vehicle. Choose a location that is hard to see but easy to reach (ex: in gas cap or under bumper). Notify your co workers where they are in case of emergency.

- Park clear of traffic, away from active areas in pullouts or extra wide straight sections of road.
- Park facing the direction of exit with access for service/towing activities.
- Ensure the parking brake is on and the transmission is in 1st gear or park.
- On steep grades, use wheel chocks and always turn the wheels towards the nearest ditch.
- Never park on a curve especially on the outside curve of a road.
- When turning around, back into the cut bank of the road and not towards the outside bank.
- Use flares where required.

3.2 All-terrain vehicles



BE SAFE & RESPECTFUL

- Large industrial vehicles can't manoeuvre as quickly as passenger vehicles. Yield to oncoming industrial vehicles, pull over and stop to allow them to pass before continuing on. As a cautionary approach, follow industrial vehicles at a safe distance - watch them, slow down and pull over if they do.
- Turn on vehicle lights during low visibility conditions.
- Do **not** pass an industrial vehicle unless that vehicle indicates that it is safe to do so.
- As the ORV rider, ensure that you are not distracted by passengers or music.
- Wear your safety equipment at **all** times and, if installed by the manufacturer, ensure your seatbelts are securely fastened.
- Drive sober – it's against the law to drive while impaired by alcohol or drugs.

PARKING \ UNLOADING

- Park clear of traffic, away from active areas, in pullouts or extra wide stretches of road with good visibility in both directions.
- If using a mobile radio notify traffic that you are clear at X km.
- Park facing the direction of exit, with access for service/towing activities.
- **Never** park on a curve.
- Use 4-way flashers where required.
- **Do not block the road under any circumstances.**

BRITISH COLUMBIA | Ministry of Forests, Lands and Natural Resource Operations

FURTHER INFORMATION

Check out:

BC's Off Road Vehicle Management Framework:
- http://www2.gov.bc.ca/gov/content/industry/natural-resource-use/land-use/crown-land/crown-land-uses/off-road-vehicles

ICBCs' ORV Registration Services:
- http://www.icbc.com/vehicle-registration/specialty-vehicles/Pages/Off-road-vehicles.aspx

BC Laws:
- http://www.bclaws.ca

Off-Road Vehicle Act:
- http://www.bclaws.ca/civix/document/id/complete/statreg/14005

Forest Service Road Use Regulation:
- http://www.bclaws.ca/Recon/document/ID/freeside/70_2004

For a suspected natural resource contravention or crime, please call the **Natural Resource Violation reporting line at 1 844 NRO-TIPS (1 844 676-8477)**.

Wildfire Reporting:	1-800-663-5555 *5555 on a cell
BC Forest Safety Council:	1-877-741-1060
Service BC:	1-800-663-7867
Report all Poachers and Polluters (R.A.P.P.):	1-877-952-7277
Emergency Management BC:	1-800-663-3456
Search and Rescue BC:	www.bcsara.com

BC **Forest Safety**
Safety is **good** business
www.bcforestsafe.org
Version 1.3 April 2017

USING ORVs ON RESOURCE ROADS

This document provides basic information for safe and responsible use of off highway recreational vehicles on resource roads. It should not be considered a replacement for any training programs or pre-trip preparation.

3.3 Electrofishing

3.3.1 Preparatory Procedures

1. A crew leader must be designated for all backpack electrofishing activities.
2. It is the crew leader's responsibility to ensure that all equipment is in "safe working order".
3. An emergency response plan must be prepared and reviewed with all crew members.
4. The crew leader must ensure all crew members have received instruction in the fundamentals of electrofishing safety.
5. The crew leader and at least one additional crew member must have up-to-date CPR and First Aid training.
6. Each electrofishing site must be visually inspected for hazards such as deep holes, submerged logs, etc. before commencing electrofishing operations.
7. In order to aid in identifying underwater hazards, all crew members must be equipped with polarized sunglasses. Glasses also protect against eye injury caused by sticks and branches. Wide brimmed hats or peaked caps are also beneficial in increasing the effectiveness of polarized glasses.
8. All crew members must be equipped with long armed gloves that are non-conductive, waterproof and inspected to be free of leaks. Gloves must be worn at all times during electrofishing operations.
9. All crew members must be equipped with chest waders that are non-conductive, waterproof and inspected to be free of leaks. Chest waders must be worn at all times during electrofishing operations by team members entering the water. Wading belts are to be worn at all times.
10. All crew members must agree on a system of communication during electrofishing operations.
11. Backpack electrofishing units must be turned off and the battery disconnected before making any connections or part replacements. Start-up Procedures
12. All crew members must be notified and acknowledge their preparedness prior to the commencement of electrofishing operations. The unit operator must make sure that personnel are clear of the anode before turning on the power. Hand signals are a useful way of conveying these messages.
13. Check operation of all switches and gauges. This should include high voltage check, anode switch, power switch and mercury tilt switch, audible tone generator and light. Set controls to appropriate levels. The minimum voltage possible to obtain the desired results should be used to avoid excessive harm to the biota and to minimize the effects of accidental shock.

3.3.2 Operational Procedures

14. Operate slowly and carefully. Footing in most streams is poor and most falls occur when crew members are hurrying. Operations should cease when fatigue sets in.

15. Team members must not place their hand(s) into the water when the power is turned on.
16. Electrofishing units must be shut off prior to entering or leaving the water and the battery terminals disconnected (or generator shut off) when not in use or when transporting the unit.
17. Life jackets or Personal Floatation Devices (PFDs) must be worn where the crew leader considers the water is of sufficient depth or velocity for a life jacket or PFD to be effective as protection from risk of drowning. Life jackets and PFDs must be approved by Transport Canada or Canadian Coast Guard. Electrofishing should not be carried out where water depth is greater than waist deep.
18. A crew member must immediately leave the water if wetness is detected in gloves or waders (by leaks, rain or perspiration) and obtain dry equipment before returning. Mild dampness from perspiration or humidity is considered normal.
19. Electrofishing operations must cease during inclement weather. (e.g. periods of any lightning or moderate rain).

COVID 19

- As electrofishing often requires the “fisher” and “netter” to be within 2m of eachother masks are required to be worn by both crew members.
- Wear disposable gloves when assembling equipment or wipe down all touch points after assembly.

3.4 Culvert and habitat confirmation assessments

See driving procedures including radio use and parking.

- Sometime parking on the shoulder of resource roads is the only practical way to assess a site. When doing so place a traffic cone 2m behind the back left wheel to alert oncoming traffic.
- Wear waders and wading boots or a non-slip rubber boot when working in the stream. Carefully assess your footing and be ready for slippery surfaces.
- Use 2 walking poles when conducting in stream surveys. Always maintain 3 points of contact with poles and your feet. This allows for much greater stability and avoids the risk of injury. As the in stream substrate typically consists of cobbles and boulders, it can be very painful when falling. Be cautious of foot placement to lower risk of foot entrapment. Poles are often used in photos to have a frame of reference for measurements of stream characteristics. One pole can be used for scale, while the other one can remain in hand as a stabilizer.
- Carry bear spray with you at all times when in the field. You never know when you’ll need to use it.
- Always carry personal first aid kit, water, extra clothes, inreach satellite communicator and food (ex. Power bar) in your vest in case of an emergency.

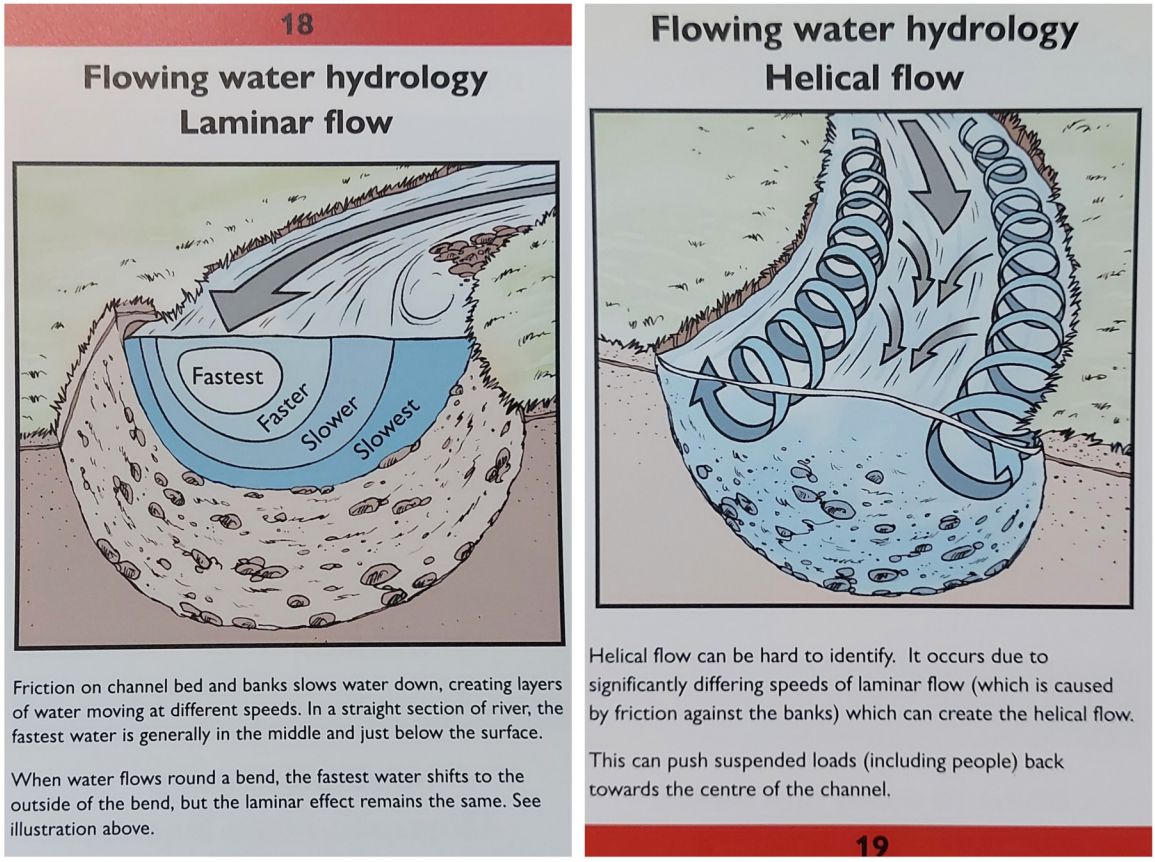
- High visibility field vest should be worn to avoid being mistaken for an animal by hunters.
- Navigating to sites often requires the use of handheld devices such as phones, two-way radios or GPS which should either be used by a non-driving crew member or mounted on the windshield where they can be viewed without distracting the driver.
- Touching base with the call in person throughout the day is essential so that your last known location is known and to minimize the potential for false alarms should you not check in on time at the end of the day. Inreaches should be tested between crew members and between crew members and check in people before going in the field.

3.5 Swiftwater rescue and safety

Most of our field work involves working in small streams or creeks. Sometimes we can find ourselves in larger systems that have fast flowing water. It is important to be prepared and to be safe. Below are some best practices for swiftwater rescue and safety.

- Never put your foot down if you are being swept away. This will prevent foot entrapment.
- Never tie a rope around a rescuer. Attach a line to a quick release strap if present.
- Always deploy upstream spotters to know what is going to be coming down toward you.
- If you are rescuing someone, wear a PFD and a helmet.
- Always have a backup plan.
- Never count on the victim to help in his or her own rescue.
- Never tie a tension line at a right angle.
- Never lose contact with the victim.
- In addition to drowning, other dangers in swift water rescues include hypothermia, trauma, remote areas, and frightened victims.
- Water in swift water rescues is powerful but predictable. Marking water levels and understanding factors such as eddies (calm water behind obstructions), hazards (underwater obstructions), and “keepers” (areas where victims may be stuck) can aid decision-making.

It is important to understand the flow of a stream. Understanding where flow velocities are highest will help you navigate watersheds more efficiently and reduce the risk of injury.



18

Flowing water hydrology
Laminar flow

Friction on channel bed and banks slows water down, creating layers of water moving at different speeds. In a straight section of river, the fastest water is generally in the middle and just below the surface.

When water flows round a bend, the fastest water shifts to the outside of the bend, but the laminar effect remains the same. See illustration above.

Flowing water hydrology
Helical flow

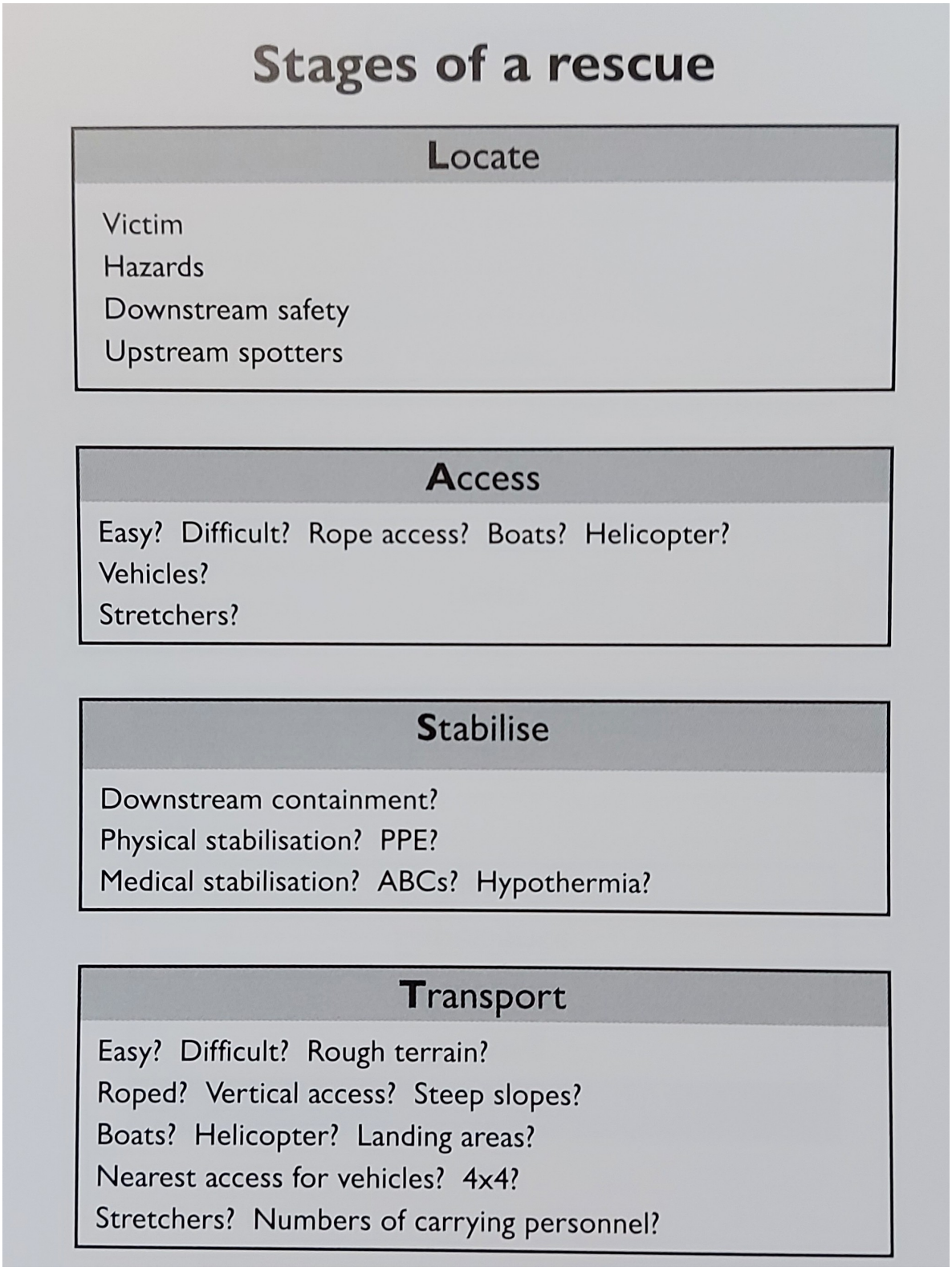
Helical flow can be hard to identify. It occurs due to significantly differing speeds of laminar flow (which is caused by friction against the banks) which can create the helical flow.

This can push suspended loads (including people) back towards the centre of the channel.

19

Source: Raven Rescue Water Rescue Field Guide

When attempting a rescue, consider the questions contained within the L.A.S.T. stages of rescue, outlined in the image below.



Source: Raven Rescue Water Rescue Field Guide

Swiftwater rescue PPE equipment list:

- Helmet
- Knife
- Gloves
- PFD with quick release harness
- Drysuit
- Throwbag
- Boots
- Whistle

3.6 Working Alone

Working alone means working in circumstances where assistance would not be readily available to the worker in case of an emergency. There can be circumstances in the field where the worker will be conducting a survey alone. The lone worker must abide by the following procedures:

- Designate a contact person to check in with on a pre planned schedule. Arrange a meet up time and place before getting separated.
- The worker must carry a functioning communication device such as a cell phone, two-way radio, and a inreach satellite communicator. Carrying all three is highly recommended.
- Carry bear spray. Make a lot of noise periodically to alert bears in the area of your presence. Optionally, it can be effective to have a bluetooth speaker to play music.
- If the lone worker fails to check in, then the contact person must initiate search procedures. See Procedures for Failed Check-In section of Field Safety Plan.

3.7 Wildlife Encounters

3.7.1 Bears

Situation	Recommended actions
	Move away undetected. Go back the way you came or take large detour around. If you must go ahead do so slowly and cautiously. DO NOT RUN
Bear does not know you are there	Keep your eye on the bear. Watch for changes in behavior. Be careful not to crowd or surprise bear (especially Grizzlies). Do not shout if it is unaware of your presence.
Bear becomes aware of you	Calmly and from as far away as possible identify yourself as human.

Situation	Recommended actions
Talk to the bear in a low, respectful voice. Wave your arms slowly. Increase the distance between you and the bear. If possible, move upwind to give the bear your scent. When bear is aware and unconcerned take the opportunity to leave. Do not run.	
If you hear bear vocalizations or see young bears in area	Be extremely cautious and leave the area the way you came.
If bear approaches you	Stop, stay calm, and assess the situation: is bear acting defensively (grunting, or another way? Don't run. Group together if possible. Prepare deterrent (mace). Determine if bear is **defensive or aggressive.**
Bear approaching in a defensive (stressed) manner	**Defensive bears are threatened or may be protecting food. They show stressed behaviour such as rapid huffing, salivating, roaring, paw slapping, guttural noises, open mouthed jawing and charging.** When bear approaches or charges stand your ground (physical contact is rare). Most charges stop short. Appear non-threatening. Talk to bear in calm voice and let it know you mean it no harm. Don't shout or throw things acting defensively. Try to increase distance between you and the bear (keep your eye on it). Do not run. Use deterrent only as last defense.
In the case of a defensive	

Situation	Recommended actions
attack	If bear physically contacts you in a defensive attack play dead: fall on ground on your front, protect your neck. If rolled over continue to roll over to face. Stay on ground till bear leaves. If attack is prolonged it is no longer defensive.
Bear approaching in **non-defensive** manner	**Non defensive bears show little stress. They look interested in you and intent on approaching you. Watch towards you confidently looking towards you intermittently. They seem intent on attack.** If approached move away from bears path or trail. If bear is intent on you stand your ground. **Your response needs to be assertive.** Act aggressively: shout at bear, stare it in the eye, stamp feet, stand on stump or log, threaten bear with stick or log. If attacked use deterrent, fight with any weapon available with all your strength. Focus attack on bear's face.

Staying safe in bear country video: https://www.youtube.com/watch?v=s-zkGuh42l4&ab_channel=bearbiology

3.7.2 Cougars

- Make a lot of noise when working and walking
- Avoid cougar kills. Cougars cover their kills with dirt and leaves and return later. Be aware for circling birds and other scavengers; these could indicate there is a kill site nearby.
- **If you encounter a cougar:**
  - Don't run, this might trigger a pursuit
  - Don't turn your back, always keep the cougar in front of you
- **If the cougar shows interest in you** (staring, crouching, creeping, tail twitching):
  - Make eye contact
  - Make yourself look big
  - Show your teeth, pretend to be a predator
  - Make loud noises
  - Arm yourself with anything you can find
- **If the cougar attacks:**
  - Fight back, convince the cougar you are the predator and not the prey
  - Yell or make loud, intimidating noises
  - Focus your attacks on the cougar's nose, face, and eyes

3.7.3 Moose

A moose will charge to ward off a potential threat. Assure the moose that you are not a threat.

- **Signs of an aggressive moose:**
  - Walking in your direction
  - Stomping its feet
  - Peeling its ears back
  - Grunting
  - Throwing its head back and forth
- **How to prevent and survive a moose attack:**
  - Back away with palms facing the moose
  - Speak softly and reassuringly to it
  - If the moose charges then get behind a large tree or rock, most moose charges are bluffs
  - If the moose attacks you then fake death by curling up in a ball, protect your neck and back

3.8 Remote Working

Approximately 75% of the work done at New Graph Environment is remote from the employee's home. Safe work practices are still important when working remotely.

3.8.1 Ergonomics

Ergonomics are an important part to any home office. Your home work space should meet basic ergonomic requirements in order to decrease risk of long term injuries. Listed below are a few guidelines:

- It starts with a good chair. Ensure your chair is properly adjusted so that your wrists are straight, with hands below or at elbow level, knees are level with hips and thighs parallel to the floor, feet are flat on the ground, and the top of your computer display is positioned at or just below eye level. Get a chair with proper lumbar support.
- Invest in a good mouse and keyboard that offer good wrist support and comfort.
- Buy a proper desk that has enough room for all your equipment and is of appropriate height. Adjustable desks are a good option since you can switch between sitting and standing positions.
- Do not sit in one place all day long. Make sure you get up and walk around and/or stretch throughout the day to relieve muscle and joint pain.

3.8.2 Mental and Physical Health

When working remotely, it is important to maintain your mental and physical health. Listed below are a few ways to reduce stress and improve your mental and physical health:

- Stick to a regular work routine and schedule every day, and switch off on your down time.
- Take a break every now and then to get up and walk around.
- If a task you're working on is causing you too much stress then don't be afraid to delegate or ask for help, avoid burnout and overworking yourself.
- Stick to a good work life balance, make time for socialising and enjoying your favorite hobbies/physical activities.

- Sun exposure is limited when working inside and it can therefore be hard to get your daily Vitamin D requirements, consider taking a supplement.
- Seasonal affective disorder can affect everyone and can cause a decrease in energy levels and change in mood in the winter time, ensure you go outside everyday and engage in regular physical activity to reduce stress levels.
- When leaving the house to go to a work related meeting be aware of road conditions when driving, even when walking (steer clear of ice to avoid nasty falls).

Appendices

Appendix 1 - New Worker Orientation

Appendix 2 - Tailboard Template

Appendix 3 - Incident/Close Call Template

Appendix 4 - Contractor Selection and Safety Checklist

Appendix 5 - First Aid Requirements

References

Session Info

```
R version 4.2.2 (2022-10-31)
Platform: aarch64-apple-darwin20 (64-bit)
Running under: , RStudio 2023.6.1.524

Locale: en_US.UTF-8 / en_US.UTF-8 / en_US.UTF-8 / C / en_US.UTF-8 /
en_US.UTF-8

Package version:
  analogsea_1.0.6          AsioHeaders_1.22.1.2     askpass_1.1
assertthat_0.2.1         backports_1.4.1          base64enc_0.1-3
bcdata_0.4.0
  BH_1.81.0.1              bibtex_0.5.1             bit_4.0.5
bit64_4.0.5              bitops_1.0-7             blob_1.2.3
bookdown_0.32
  boot_1.3.28.1            broom_1.0.3              bslib_0.5.0
cachem_1.0.8             callr_3.7.3              cellranger_1.1.0
chk_0.8.1.9002
  citr_0.3.2               class_7.3-21             classInt_0.4-8
cli_3.6.1                clipr_0.8.0              codetools_0.2-19
colorspace_2.1-0
  commonmark_1.9.0         compiler_4.2.2           conflicted_1.2.0
cpp11_0.4.3              crayon_1.5.2             crosstalk_1.2.0
crul_1.3
  curl_5.0.1               data.table_1.14.8        datapasta_3.1.0
DBI_1.1.3                dbplyr_2.3.0             digest_0.6.33
doParallel_1.0.17
  dplyr_1.1.0              dtplyr_1.3.0             e1071_1.7-13
elevatr_0.4.2            ellipsis_0.3.2           english_1.2-6
evaluate_0.20
  exifr_0.3.2              fansi_1.0.4              farver_2.1.1
fasstr_0.5.0             fastmap_1.1.1            fishbc_0.2.1.9000
fitdistrplus_1.1.8
  fontawesome_0.5.1        forcats_1.0.0            foreach_1.5.2
foreign_0.8-84           fpr_1.0.2.9000           fs_1.6.2
furrr_0.3.1
  future_1.31.0            fwapgr_0.1.0.9013        gargle_1.3.0
generics_0.1.3           geojson_0.3.4            geojsonio_0.10.0
geojsonsf_2.0.3
  geometries_0.2.1         ggdark_0.2.1             ggmap_3.0.1.900
ggplot2_3.4.1            globals_0.16.2           glue_1.6.2
googledrive_2.0.0
  googlePolylines_0.8.2    googlesheets4_1.0.1      googleway_2.7.6
graphics_4.2.2           grDevices_4.2.2          grid_4.2.2
```

```
gtable_0.3.1              haven_2.5.1               highr_0.10
hms_1.1.3                 htmltools_0.5.5           htmlwidgets_1.6.1
httpcode_0.3.0
  httpuv_1.6.11             httr_1.4.5                ids_1.0.1
isoband_0.2.7             iterators_1.0.14          janitor_2.2.0
jpeg_0.1-10
  jqr_1.2.3                 jquerylib_0.1.4           jsonify_1.2.2
jsonlite_1.8.7            kableExtra_1.3.4          Kendall_2.2.1
KernSmooth_2.23-20
  knitr_1.42                labeling_0.4.2            later_1.3.1
lattice_0.20-45           lazyeval_0.2.2            leafem_0.2.0
leaflet_2.1.1
  leaflet.extras_1.0.0      leaflet.providers_1.9.0   lifecycle_1.0.3
listenv_0.9.0             lubridate_1.9.2           magick_2.7.3
magrittr_2.0.3
  maptools_1.1-6            markdown_1.5              MASS_7.3.58.2
Matrix_1.5.3              memoise_2.0.1             methods_4.2.2
mgcv_1.8.41
  mime_0.12                 miniUI_0.1.1.1            modelr_0.1.10
munsell_0.5.0             nabor_0.5.0               nlme_3.1.162
openssl_2.0.6
  openxlsx_4.2.5.2          pacman_0.5.1              pagedown_0.20.1
parallel_4.2.2            parallelly_1.34.0         pdftools_3.3.3
PearsonDS_1.2.3
  pgfeatureserv_0.0.0.9003 pillar_1.9.0              pkgconfig_2.0.3
plogr_0.2.0               plyr_1.8.8                png_0.1-8
poisspatial_0.1.0.9000
  poisutils_0.0.0.9010      prettyunits_1.1.1         processx_3.8.2
progress_1.2.2            progressr_0.13.0          promises_1.2.0.1
protolite_2.2.0
  proxy_0.4-27              ps_1.7.5                  purrr_1.0.1
qpdf_1.3.0                R6_2.5.1                  ragg_1.2.5
rapidjsonr_1.2.0
  rappdirs_0.3.3            raster_3.6-14             rayimage_0.9.1
rayshader_0.24.10         RColorBrewer_1.1.3        Rcpp_1.0.11
RcppArmadillo_0.12.0.1.0
  RcppEigen_0.3.3.9.3       RcppRoll_0.3.0            readr_2.1.4
readwritesqlite_0.2.0     readxl_1.4.2              RefManageR_1.4.0
rematch_1.0.1
  rematch2_2.1.2            remotes_2.4.2             reprex_2.0.2
rgdal_1.6-4               rgeos_0.6-1               rgl_1.0.1
RgoogleMaps_1.4.5.3
  rJava_1.0-6               rlang_1.1.1               rmarkdown_2.21
RPostgres_1.4.5           RPostgreSQL_0.7-5         RSQLite_2.3.0
rstudioapi_0.15.0
  rvest_1.0.3               s2_1.1.2                  sass_0.4.6
scales_1.2.1              selectr_0.4.2             servr_0.25
```

```
sf_1.0-9
  sfheaders_0.4.0          shiny_1.7.4.1            shinyjs_2.1.0
slippymath_0.3.1         snakecase_0.11.0         sourcetools_0.1.7.1
sp_1.6-0
  splines_4.2.2            stats_4.2.2              stringi_1.7.12
stringr_1.5.0            survival_3.5.3           svglite_2.1.1
sys_3.4.2
  systemfonts_1.0.4        terra_1.7-3              terrainmeshr_0.1.0
textshaping_0.3.6        tibble_3.2.1             tidyhydat_0.5.9
tidyr_1.3.0
  tidyselect_1.2.0         tidyverse_2.0.0          timechange_0.2.0
tinytex_0.45             tools_4.2.2              triebeard_0.3.0
tzdb_0.4.0
  units_0.8-1              urltools_1.7.3           utf8_1.2.3
utils_4.2.2              uuid_1.1.0               V8_4.2.2
vctrs_0.6.3
  viridis_0.6.2            viridisLite_0.4.1        vroom_1.6.3
webshot_0.5.4            websocket_1.4.1          withr_2.5.0
wk_0.7.1
  xfun_0.39                xlsx_0.6.5               xlsxjars_0.6.1
XML_3.99.0.13            xml2_1.3.3               xtable_1.8-4
yaml_2.3.7
  yesno_0.1.2              zip_2.2.2                zyp_0.11
```